

【CLAIMS】

【Claim 1】 A track-movable lighting system comprising:

a track fixedly installed on a ceiling of a structure;

a plurality of transport units installed on the track so that the transport units

5 can move along the track by means of motors;

lighting devices respectively installed on the transport units so that the lighting devices can move together with the movement of the transport units; and

control devices for respectively controlling the movement of the corresponding transport units and the operation of the corresponding lighting
10 devices,

wherein:

the track includes a guide rail fixed to the ceiling of the structure by a fixing member, and a plurality of trolley bars installed on the guide rail through insulators;

Each of the transport units includes a frame having a plurality of wheels, a
15 motor installed on the frame for driving the wheels, a collector for transmitting electric power or a data signal, flowing along the trolley bars, to the transport unit, and an encoder for calculating the moving distance of the transport unit by means of the motor; and

Each of the control devices includes a main control unit installed at a
20 designated position of the structure, and a subsidiary control unit installed on the corresponding transport unit for controlling the movement of the corresponding one of transport units and the operation of the corresponding one of the lighting devices.

【Claim 2】 The track-movable lighting system as set forth in claim 1,

wherein several trolley bars of the plural trolley bars serve as electric
25 power lines for supplying electric power of a designated voltage to the motor of the transport unit and the lighting device, other several trolley bars of the plural trolley bars serve as data communication lines for allowing the main control unit and the subsidiary control unit of the control device to communicate with each other, and remaining several trolley bars of the plural trolley bars serve as DC power supply

lines for supplying DC power to the subsidiary control unit.

【Claim 3】 The track-movable lighting system as set forth in claim 1, wherein the collector includes:

5 a slide member sliding by electrical contact with the corresponding one of the trolley bars;

a support member for supporting the slide member to the frame of the transport unit;

10 a conductive wire for electrically connecting the slide member and the transport unit so that the electric power or the data signal is transmitted therebetween; and

an elastic member for pressing the slide member so that the slide member firmly contacts the corresponding one of the trolley bars.

【Claim 4】 The track-movable lighting system as set forth in claim 1, wherein:

15 the guide rail has an approximately I-shaped section; and

the trolley bars are arranged in parallel at both sides of the guide rail.

【Claim 5】 The track-movable lighting system as set forth in claim 1, wherein:

20 the guide rail, the lower surface of which is opened, is extended in a transverse direction, and has an approximately C-shaped section; and

the trolley bars are arranged in series on the opened lower surface of the guide rail by the insulators.

25 【Claim 6】 The track-movable lighting system as set forth in claim 1, wherein each of the control devices further includes a personal computer for monitoring data of the corresponding transparent unit and the corresponding lighting device and controlling the operation of the corresponding transparent unit and lighting device through the main control unit and the subsidiary control unit.

【Claim 7】 The track-movable lighting system as set forth in claim 1, wherein a plurality of the transparent units installed on the track are independently controlled by the corresponding control devices.

5 【Claim 8】 The track-movable lighting system as set forth in claim 1, wherein each of the lighting devices is rotated such that the angle of the lighting device can be vertically and horizontally adjusted by the corresponding control device.

10 【Claim 9】 The track-movable lighting system as set forth in claim 1, further comprising an equipment for maintaining and cleaning the lighting devices, wherein the equipment is a separate space in the structure, or a handrail structure temporarily installed at a wall of the structure.

15 【Claim 10】 The track-movable lighting system as set forth in claim 9, wherein an automatic light washer is installed in the equipment, so that the transport units are moved at a designated time interval to wash the lighting devices of the transport units using the automatic light washer.

20 【Claim 11】 The track-movable lighting system as set forth in claim 1, further comprising a plurality of dust protective covers continuously installed along the track, such that the dust protective covers are opened and closed, for preventing the track from being contaminated by dust, wherein the dust protective covers are opened by guide protrusions attached to the transport units only when the transport units pass, and are closed under the normal circumstances.